DOCUMENT RESUME

ED 068 551 TM 002 032

TITLE	Department Head-Buyer (ret. tr.) 299.138--Technical Report on Development of USES Aptitude Test Battery.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	S-420
PUB DATE	Jul 68
NOTE	13p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Cutting Scores; Evaluation Criteria; Job Applicants; *Job Skills; Merchandising; Norms; Occupational Guidance; *Personnel Evaluation; *Retailing; Test Reliability; Test Validity
IDENTIFIERS	Department Head Buyer; GATB; *General Aptitude Test Battery

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimentl sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample and a personnel evaluation form are also included. (AG)

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ED 068551

TM 002 082

Development of USES Aptitude Test Battery

for

Department Head-Buyer

(ret. tr.) 299.138

U.S. DEPARTMENT OF LABOR
MANPOWER ADMINISTRATION

ED 068551

Technical Report on Development of USES Aptitude Test Battery

For . . . .

Department Head-Buyer (ret. tr.) 299.138

S-420

(Developed in Cooperation with the North Carolina State Employment Service)

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July 1968

FOREWORD

The United States Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 aptitudes: General Learning Ability, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination, predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

Charles E. Odell, Director
U.S. Employment Service

GATB Study #2708

DEVELOPMENT OF USES APTITUDE TEST BATTERY

FOR

Department Head-Buyer (ret. tr.) 299.138-012

S-420

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Department Head-Buyer (ret. tr.) 299.138-012. The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB Scores
N - Numerical	80
P - Form Perception	85
Q - Clerical Perception	90

RESEARCH SUMMARY

Sample: 59 (12 male and 47 females) workers employed as Department Head-Buyers by the Belk Stores in Georgia, South Carolina, Alabama, Florida, Tennessee and North Carolina.

Criterion: Supervisory ratings

Design: Concurrent (test and criterion data were collected at approximately the same time). Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations, aptitude-criterion correlations and selective efficiencies.

Concurrent Validity: Phi Coefficient = .24 (P/2 .05)

Effectiveness of Norms: Only 70% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the S-420 norms, 78% would have been good workers. 30% of the nontest-selected workers used for this study were poor workers; if the worker had been test-selected with the S-420 norms, only 22% would have

been poor workers. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	70%	78%
Poor Workers	30%	22%

SAMPLE DESCRIPTION

Size: N = 59

Occupational Status: Employed workers.

Work Setting: 4 retail stores in Georgia
4 retail stores in South Carolina
2 retail stores in Alabama
4 retail stores in Florida
1 retail store in Tennessee
12 retail stores in North Carolina

Selection Requirements:

Education: No requirement

Previous Experience: No requirement

Tests: None

Other: None

Principal Activities: The job duties for each worker are comparable to those shown in the job description in the appendix.

Minimum Experience: All workers had at least four months job experience.

TABLE 2

Means, Standard Deviation (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 59	Mean	SD	Range	r
Age (years)	44.5	9.4	20-66	-.048
Education (years)	12.4	1.4	8-17	.015
Experience (months)	82.3	84.9	4-391	-.068

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002B were administered during October and December 1966 and June 1967.

CRITERION

The criterion consisted of supervisory rating of job proficiency made at approximately the same time as the test data were collected. The ratings were made by the workers' immediate supervisor.

Rating Scale: A specific rating scale for this job was constructed. This scale included 23 items covering different aspects of job performance. Each item had 5 levels corresponding to different degrees of job proficiency.

Reliability: A significant biserial correlation of .743 was found between the total score for all specific items and the dichotomized overall evaluation item.

Criterion Distribution:

Possible Range	1 - 115
Actual Range	34 - 107
Mean	62.5
Standard Dev.	16.3

Criterion Dichotomy: The criterion distribution was dichotomized into low and high groups by placing 30% of the sample in the low criterion group to correspond with the percentage of workers considered unsatisfactory or marginal by company officials. Workers in the high criterion group were designated as "good workers" and those in the low group as "poor workers." The criterion critical score is 54.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of job duties involved and a statistical analysis of test and criterion

data. Aptitudes G and V which do not have a high correlation with the criterion were considered for inclusion in the norms because the qualitative analysis indicated they were important for the job duties and the sample had a relatively low standard deviation for these aptitudes. Tables 3, 4, and 5 shown the results of the qualitative and statistical analyses.

TABLE 3

Qualitative Analysis
(Based on the job analysis, the aptitudes indicated appear to be important to the work performed)

Aptitude	Rationale
G - General Learning Ability	Necessary in learning and applying principles of buying and marketing. Necessary in planning and directing activity of department.
V - Verbal Aptitude	Necessary in communicating with other employees and sales representatives.
N - Numerical Aptitude	Necessary in computing costs and prices, maintaining check of stock on hand and buying in appropriate quantities. Necessary in compiling reports.
Q - Clerical Perception	Necessary in comparing merchandise to orders and invoices and marking of stock.

TABLE 4

Means, Standard Deviation (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB

N = 59

Aptitudes	Mean	SD	Range	r
G - General Learning Ability	96.5	14.0	65-123	.215
V - Verbal Aptitude	96.1	15.0	66-135	.124
N - Numerical Aptitude	98.0	15.9	71-134	.324*
S - Spatial Aptitude	94.9	16.3	65-147	.066
P - Form Perception	94.6	17.5	63-148	.303*
Q - Clerical Perception	106.0	13.0	77-142	.270*
K - Motor Coordination	107.6	17.3	59-153	.225
F - Finger Dexterity	87.8	19.0	45-121	.119
M - Manual Dexterity	99.0	18.1	63-139	.191

*Significant at the .05 level

TABLE 5

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data: Important	X	X	X			X			
Irrelevant									
Relatively High Mean						X	X		X
Relatively Low SD	X	X				X			
Significant Correlation with Criterion			X		X	X			
Aptitudes to be Considered for Trial Norms	G	V	N		P	Q			

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of a comparison of the degree to which trial norms consisting of various combinations of Aptitudes G, V, N, P and Q, at trial cutting scores were able to differentiate between the 70% of the sample considered good workers and the 30% of the sample considered poor workers. Trial cutting scores at five point intervals approximately one standard deviation below the mean are tried because this will eliminate about one third of the sample with three-aptitude norms. For two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about one third of the sample; for four-aptitude trial norms, cutting scores slightly less than one standard deviation below the mean will eliminate about one-third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. Norms of N-80, P-85, and Q-90 provided the optimum differentiation for the occupation of Department Head-Buyer (ret. tr.) 299.138-012. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .24 (statistically significant at the .05 level).

TABLE 6

Concurrent Validity of Test Norms N-80, P-85, and Q-90

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	9	32	41
Poor Workers	9	9	18
Total	18	41	59

Phi Coefficient (Ø) = .24 Chi Square (X^2_v) = 3.4
Significance Level = P/2 .05

DETERMINATION OF OCCUPATIONAL APTITUDE NORMS

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 36 OAP's included in Section II of the Manual for the General Aptitude Test Battery. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.

A-P-P-E-N-D-I-X

DESCRIPTIVE RATING SCALE

Score_____

Person making rating_____Job Title_____

Person being rated_____Job Title_____

Number of employees supervised by person being rated . . . . . _____

Date rating made_____Name of store_____

Location of store_____No. of employees in store_____
City State

DIRECTIONS:

We are asking you to rate the job performance of a person or persons who work for you. These ratings will be used only by consulting analysts conducting this study and will in no way affect the individual's job status. Your ratings will serve as a "yardstick" against which test scores can be compared in this study to develop aptitude tests for your organization. Your ratings must give a true picture of the person you are rating or this study will have little value. Following are some points which may help you.

1. On each item compare your worker with "workers-in-general" in this job- - - with other workers you have known. This is most important in small stores in which there are fewer workers. The ratings should be based on the same standard for all stores.
2. Consider each item separately. Don't let one outstanding trait affect your overall judgment. The items ask about different abilities. A worker may be good in one ability and poor in another.
3. Rate the person according to the work he has done over a period of several weeks or months. Don't rate just on the basis of one "good" day or one "bad" day. Think in terms of each worker's usual or typical performance.
4. Objectively rate only on the abilities listed on the rating sheet. Do not let factors such as cooperativeness, ability to get along with others, and promptness influence your ratings. Although these factors are important, they have no value in comparing test scores.

	Superior	Outstanding	Above Standard	Standard	Needs Improvement	Does N Appl
BUYING						
1. Buying in appropriate quantities.						
2. Meeting seasonal demands.						
3. Buying merchandise in appropriate price lines.						
4. Spacing orders effectively.						
5. Budgeting purchases for maximum turnover.						
6. Knowledge of purchase sources.						
7. Awareness of current trends in public buying habits.						
8. Knowledge of customer preferences within market area.						
9. Checking merchandise received against specifications of order.						
10. Ascertaining return of merchandise to source.						
11. Adherence to departmental budget.						
BUDGETING						
1. Pricing merchandise in line with competition.						
2. Recognizing need for mark-down and acting to avoid dead inventory.						
3. Verifying correctness of price tags.						

	Superior	Outstanding	Above Standard	Standard	Needs Improvement	Does Not Apply
SUPERVISORY DUTIES						
1. Assigning duties to create greatest use of workers' time.						
2. Use of effective training techniques in sales.						
3. Effective training in store policies, services, and internal controls.						
4. Evaluating performances of workers supervised.						
5. Counseling individuals toward self improvement.						
6. Ensuring that stations are orderly and clean.						
INDIVIDUAL EVALUATIO.'						
1. Proper use of own time.						
2. Speed with which he learns and adjusts to new aspects of job.						
3. Overall efficiency of performance.						

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